We claim:

1. A method of separating elongated semiconductor strips from a wafer of semiconductor material, said method comprising the steps of:

providing a plurality of elongated semiconductor strips formed in a wafer in a substantially parallel manner with respect to each other, said wafer having a substantially planar surface and a thickness dimension at a right angle to the substantially planar surface and a frame portion at opposite ends of said semiconductor strips connecting said strips to said wafer, said semiconductor strips each having a width at least substantially equal to the wafer thickness and a thickness dimension of said strip less than said width, a face of at least one of elongated semiconductor strips lengthwise forming an edge of said wafer or being nearest adjacent said edge;

applying vacuum to said elongated semiconductor strip forming said edge or being adjacent to said edge; and

displacing said wafer and a source of said vacuum relative to each other a predetermined distance to separate said elongated semiconductor strip having vacuum applied to said elongated semiconductor strip from said wafer.

2. The method according to claim 1, further comprising the steps of:

at least reducing said vacuum applied to said separated, elongated semiconductor strip; and

displacing said separated, elongated semiconductor strip and said source of said vacuum relative to each other.

3. The method according to claim 1, wherein the step of at least reducing said vacuum comprises terminating said vacuum.

4. The method according to claim 1, further comprising the step of:

moving said wafer so that said elongated semiconductor strip is in close proximity to said source of said vacuum.

5. The method according to claim 1, further comprising the step of:

moving said source of said vacuum relative to said wafer so that said source of said vacuum is in close proximity to said elongated semiconductor strip.

6. The method according to any one of claims 1 to 5, wherein said steps are repeatedly performed to separate two or more of said plurality of said elongated semiconductor strips from said wafer.

7. The method according to any one of claims 1 to 6, wherein said source of said vacuum has a body with at least one cavity formed therein for providing said applied vacuum, said cavity adjacent said elongated semiconductor strip being substantially the same in size as or smaller than a dimension of a face of said elongated semiconductor strip.

8. The method according to any one of claims 1 to 7, further comprising the step of:

forming weak points in portions of said wafer adjacent opposite ends of said elongated semiconductor strips to facilitate separation of said elongated semiconductor strip from said wafer.

9. The method according to any one of claims 1 to 8, wherein said wafer is single crystal silicon or multicrystalline silicon.

10. An apparatus for separating elongated semiconductor strips from a wafer of semiconductor material, said apparatus comprising:

means for holding a wafer having a plurality of elongated semiconductor strips formed in a substantially parallel manner with respect to each other in said wafer, said wafer having a substantially planar surface and a thickness dimension at a right angle to the substantially planar surface and a frame portion at opposite ends of said semiconductor strips connecting said strips to said wafer, said semiconductor strips each having a width at least substantially equal to the wafer thickness and a thickness dimension of said strip less than said width, at least one of elongated semiconductor strips lengthwise forming an edge of said wafer or being nearest adjacent said edge;

a vacuum source to apply vacuum to said face of said elongated semiconductor strip forming said edge or being adjacent to said edge; and

means for displacing said wafer and said source of said vacuum relative to each other a predetermined distance to separate said elongated semiconductor strip having vacuum applied to said elongated semiconductor strip from said wafer.

11. The apparatus according to claim 10, where said vacuum applied to said separated, elongated semiconductor strip is at least reduced, and further comprising means for displacing said separated, elongated semiconductor strip and said source of said vacuum relative to each other.

12. The apparatus according to claim 10, wherein at least reducing said vacuum comprises terminating said vacuum.

13. The apparatus according to claim 10, further comprising:

means for moving said wafer so that said elongated semiconductor strip is in close proximity to said source of said vacuum.

14. The apparatus according to claim 10, further comprising:

means for moving said source of said vacuum relative to said wafer so that said source of said vacuum is in close proximity to said elongated semiconductor strip.

15. The apparatus according to any one of claims 10 to 14, further comprising means for controlling operation of at least said holding means, said source of said vacuum, and said displacing means to repeatedly perform operations to separate two or more of said plurality of said elongated semiconductor strips from said wafer.

16. The apparatus according to any one of claims 10 to 15, wherein said source of said vacuum has a body with at least one cavity formed therein for providing said applied vacuum, said cavity adjacent said face of said elongated semiconductor strip being substantially the same in size as or smaller than a dimension of a face of said elongated semiconductor strip.

17. The apparatus according to any one of claims 10 to 16, further comprising:

means for forming weak points in portions of said wafer adjacent opposite ends of said elongated semiconductor strips to facilitate separation of said elongated semiconductor strip from said wafer.

18. The apparatus according to any one of claims 10 to 17, wherein said wafer is single crystal silicon or multicrystalline silicon.

19. A method of assembling a plurality of elongated semiconductor strips separated from a wafer of semiconductor material into an array of said strips, said method comprising the steps of:

receiving at a predetermined position of at least one belt one of said elongated semiconductor strips oriented lengthwise across said belt;

moving said belt in a given direction by a predetermined distance greater than the width of said elongated semiconductor strip; and

repeating said receiving and moving steps until all of said elongated semiconductor strips have been processed.

20. The method according to claim 19, wherein a vacuum source applies a vacuum to said elongated semiconductor strip and is used to deliver said elongated semiconductor strip at said predetermined position, and said predetermined distance is relative to said vacuum source.

21. The method according to claim 19 or 20, wherein said belt is made of a tape-like fabric and has adhesive on a surface upon which said elongated semiconductor strip is received.

22. The method according to claim 21, wherein said belt is made of mylar.

23. The method according to claim 19 or 20, wherein said belt is castellated and has a distance between adjacent castellations substantially wider than the width of said elongated semiconductor strip, said predetermined position located between castellations on said belt and each elongated semiconductor strip is located between two adjacent castellations on said belt.

24. The method according to claim 23, further comprising the steps of:

transferring each elongated semiconductor strip from said belt to at least one further belt located adjacent thereto, said at least one further belt having castellations with a distance between adjacent castellations greater than the width of an elongated semiconductor strip but substantially less than adjacent castellations of said belt that received said elongated semiconductor strip;

moving said further belt in a given direction by a predetermined distance greater than the width of said elongated semiconductor strip; and

repeating said transferring and moving steps until at least a portion of said elongated semiconductor strips have been processed forming said array of strips.

25. The method according to claim 24, wherein said transferring step comprises applying vacuum to each elongated semiconductor strip during movement of said further belt.

26. The method according to any one of claims 19 to 23, wherein said at least one belt comprises two parallel belts.

27. The method according to claim 24 or 25, wherein said at least one belt comprises two parallel belts and said at least one further belt comprises two further parallel belts.

28. An apparatus for assembling a plurality of elongated semiconductor strips separated from a wafer of semiconductor material into an array of said strips, said apparatus comprising:

at least one belt receiving at predetermined positions one of said elongated semiconductor strips oriented lengthwise across said belt;

a motor moving said belt in a given direction by a predetermined distance greater than the width of said elongated semiconductor strip; and

a controller coupled to said motor repeating said receiving and moving operations until all of said elongated semiconductor strips have been processed.

29. The apparatus according to claim 28, further comprises a vacuum source applying a vacuum to said elongated semiconductor strip and used to deliver said elongated semiconductor strip at said predetermined positions, said predetermined distance being relative to said vacuum source.

30. The apparatus according to claim 28 or 29, wherein said belt is made of a tape-like fabric and has adhesive on a surface upon which said elongated semiconductor strip is received.

31. The apparatus according to claim 29, wherein said belt is made of mylar.

32. The apparatus according to claim 28 or 29, wherein said belt is castellated and has a distance between adjacent castellations substantially wider than the width of said elongated semiconductor strip, said predetermined position located between castellations on each belt and each elongated semiconductor strip located between two adjacent castellations on said belt.

33. The apparatus according to claim 29, further comprising:

at least one further belt located adjacent to said at least one belt;

means for transferring each elongated semiconductor strip from said belt to said further belt, said at least one further belt having castellations with a distance between adjacent castellations greater than the width of an elongated semiconductor strip but substantially less than adjacent castellations of said belt that received said elongated semiconductor strip; and

a motor moving said further belt in a given direction by a predetermined distance greater than the width of said elongated semiconductor strip;

wherein said controller repeats said transferring and moving operations until at least a portion of said elongated semiconductor strips have been processed forming said array of strips.

34. The apparatus according to claim 33, wherein said transferring means comprises a second vacuum source applying vacuum to each elongated semiconductor strip during movement of said further belt.

35. The apparatus according to any one of claims 28 to 32, wherein said at least one belt comprises two parallel belts.

36. The apparatus according to claim 33 or 34, wherein said at least one belt comprises two parallel belts and said at least one further belt comprises two further parallel belts.

37. A method of assembling an array of elongated semiconductor strips on a substrate, said method comprising the steps of:

applying adhesive material on said substrate in a predetermined manner;

applying vacuum to each one of said elongated semiconductor strips to maintain said strips in said array, said array being a predefined arrangement of said strips;

transferring said array of elongated semiconductor strips to said substrate and bringing a face of each elongated semiconductor strip into contact with a portion of said adhesive material; and

ceasing said vacuum applied to each elongated semiconductor strip to provide said array of elongated semiconductor strips located in situ on said substrate and adhering to said substrate.

38. The method according to claim 37, further comprising the step of applying electrically conductive material to said substrate to electrically connect two or more of said elongated semiconductor strips in said array adhering to said substrate.

39. The method according to claim 38, wherein said applying step comprises printing pads of said electrically conductive material on said substrate.

40. The method according to claim 38, wherein said adhesive material is applied on said substrate in elongated strips.

41. An apparatus for assembling an array of elongated semiconductor strips on a substrate, said apparatus comprising the steps of:

means for applying adhesive material on said substrate in a predetermined manner;

a vacuum source applying vacuum to each one of said elongated semiconductor strips to maintain said strips in said array, said array being a predefined arrangement of said strips; and

means for transferring said array of elongated semiconductor strips to said substrate and bringing a face of each elongated semiconductor strip into contact with a portion of said adhesive material;

wherein said vacuum source ceases said vacuum applied to each elongated semiconductor strip to provide said array of elongated semiconductor strips located in situ on said substrate and adhering to said substrate.

42. The apparatus according to claim 41, further comprising means for applying electrically conductive material to said substrate to electrically connect two or more of said elongated semiconductor strips in said array adhering to said substrate.

43. The apparatus according to claim 42, wherein said applying means comprises a printer printing pads of said electrically conductive material on said substrate.

44. The apparatus according to claim 42, wherein said adhesive material is applied on said substrate in elongated strips.

45. A method of assembling an array of elongated semiconductor strips on a substrate, said elongated semiconductor strips formed in a wafer in a substantially parallel manner with respect to each other, said wafer having a substantially planar surface and a thickness dimension at a right angle to the substantially planar surface and a frame portion at opposite ends of said semiconductor strips connecting said strips to said wafer, said method comprising the steps of:

separating an elongated semiconductor strip from said wafer using vacuum applied to said elongated semiconductor strip forming an edge or being adjacent to an edge of said wafer;

displacing said wafer from a source of said vacuum relative by a predetermined distance;

receiving on at least one first belt said elongated semiconductor strip oriented lengthwise across said belt;

moving said belt in a given direction by a predetermined distance greater than the width of said elongated semiconductor strip;

repeating the foregoing steps until all of said elongated semiconductor strips have been processed.

46. The method according to claim 45, wherein said at least one first belt is made of a tape-like fabric and has adhesive on a surface upon which said elongated semiconductor strip is received.

47. The method according to claim 45, further comprising the step of displacing said separated, elongated semiconductor strip and said source of said vacuum relative to each other.

48. The method according to claim 45 or 47, wherein said at least one first belt is castellated and has a distance between adjacent castellations substantially wider than the width of said elongated semiconductor strip, and further comprising the steps of:

transferring each elongated semiconductor strip from said first belt to at least one second belt using vacuum, said second belt having castellations with a distance between adjacent castellations greater than the width of an elongated semiconductor strip but substantially less than adjacent castellations of said first belt;

moving said at least one second belt in a given direction by a predetermined distance greater than the width of said elongated semiconductor strip; and

repeating said transferring and moving steps until at least a portion of said elongated semiconductor strips have been processed forming said array of strips.

49. The method according to claim 48, further comprising the steps of:

transferring said array of elongated semiconductor strips using vacuum to said substrate having adhesive material applied to a surface of said substrate and bringing a face of each elongated semiconductor strip into contact with a portion of said adhesive material; and

releasing each elongated semiconductor strip by ceasing said vacuum to provide said array of elongated semiconductor strips located in situ on said substrate and adhering to said substrate.

50. The method according to claim 49, wherein said substrate also has electrically conductive material applied to said substrate to electrically connect two or more of said elongated semiconductor strips in said array adhering to said substrate.

51. The method according to any one of claims 45 to 50, wherein said wafer is single crystal silicon or multicrystalline silicon.

52. The method according to any one of claims 45 to 47, wherein said at least one first belt comprises two parallel belts.

53. The method according to claim 48 or 49, wherein said at least one first belt comprises two parallel belts and said at least one second belt comprises two further parallel belts.

54. A system for assembling an array of elongated semiconductor strips on a substrate, said elongated semiconductor strips formed in a wafer in a substantially parallel manner with respect to each other, said wafer having a substantially planar surface and a thickness dimension at a right angle to the substantially planar surface and a frame portion at opposite ends of said semiconductor strips connecting said strips to said wafer, said system comprising the steps of:

a vacuum source for separating an elongated semiconductor strip from said wafer using vacuum applied to said elongated semiconductor strip forming an edge or being adjacent to an edge of said wafer;

means for displacing said wafer from a source of said vacuum relative by a predetermined distance;

at least one first belt receiving said elongated semiconductor strip oriented lengthwise across said belt;

a motor moving said at least one belt in a given direction by a predetermined distance greater than the width of said elongated semiconductor strip;

a controller repeating the foregoing operations until all of said elongated semiconductor strips have been processed.

55. The system according to claim 54, wherein said at least one first belt is made of a tape-like fabric and has adhesive on a surface upon which said elongated semiconductor strip is received.

56. The system according to claim 54, wherein said separated, elongated semiconductor strip and said source of said vacuum can be displaced relative to each other.

57. The system according to claim 54 or 56, wherein said at least one first belt is castellated and has a distance between adjacent castellations substantially wider than the width of said elongated semiconductor strip, and further comprising:

at least one second belt having castellations with a distance between adjacent castellations greater than the width of an elongated semiconductor strip but substantially less than adjacent castellations of said at least one first belt

means for transferring each elongated semiconductor strip from said at least one first belt to said at least one second belt using vacuum; and

a motor moving said at least one second belt in a given direction by a predetermined distance greater than the width of said elongated semiconductor strip;

said controller repeating said transferring and moving operations until at least a portion of said elongated semiconductor strips have been processed forming said array of strips.

58. The system according to claim 57, further comprising:

means for transferring said array of elongated semiconductor strips using vacuum to said substrate having adhesive material applied to a surface of said substrate and bringing a face of each elongated semiconductor strip into contact with a portion of said adhesive material; and

means for releasing each elongated semiconductor strip by ceasing said vacuum to provide said array of elongated semiconductor strips located in situ on said substrate and adhering to said substrate.

59. The system according to claim 58, wherein said substrate also has electrically conductive material applied to said substrate to electrically connect two or more of said elongated semiconductor strips in said array adhering to said substrate.

60. The system according to any one of claims 54 to 59, wherein said wafer is single crystal silicon or multicrystalline silicon.

61. The apparatus according to any one of claims 54 to 56, wherein said at least one first belt comprises two parallel belts.

62. The apparatus according to claim 57 or 58, wherein said at least one first belt comprises two parallel belts and said at least one second belt comprises two further parallel belts.

63. A device, comprising:

a substrate;

an array of elongated semiconductor strips separated from a wafer of semiconductor material, said semiconductor strips each having a width substantially equal to the wafer thickness and a thickness dimension of said strip less than the width;

adhesive material deposited between said substrate and a face of each elongated semiconductor strip to adhere said substrate and each elongated semiconductor together, said face having the width of said elongated semiconductor strip as one of its dimensions; and

electrically conductive material deposited on said substrate connecting at least two of said elongated semiconductor strips together.

64. The device according to claim 63, wherein each elongated semiconductor strip comprises a sliver photovoltaic solar cell.

65. The device according to claim 64, wherein said device is a solar cell module.